

Scott Vander Wiel

Scott is a fellow of the American Statistical Association who has conducted statistics research at Los Alamos National Laboratory since 2005 and previously at Bell Laboratories since 1991. He collaborates with engineers and scientists to analyze data and develop statistical methodology for problems in diverse areas such as system reliability, cyber security, network tomography, radio astronomy, computer worm detection, numerical optimization and quality improvement. Scott won the ASA prize for Outstanding Statistical Applications and the ASQ Frank Wilcoxon prize for the Best Practical Application for a 2002 paper on modeling bandwidth in optical fiber. He holds patents on methods for network traffic modeling and for incremental quantile estimation. At Bell Labs he worked on numerous teams that won corporate achievement awards. At LANL he has focused on streaming radio astronomy analysis, weapons reliability modeling and uncertainty quantification, high explosive surveillance and cyber security. Scott earned a Ph.D. in Statistics from Iowa State University.

Education

Ph.D. Statistics, Iowa State University (1991). Dissertation: "Some Aspects of Monitoring and Control of Univariate Dynamic Systems"

M.S. Statistics, Iowa State University (1987)

B.S. Industrial Engineering, Iowa State University (1985)

Employment

Technical Staff Member: Los Alamos National Laboratory, Los Alamos, NM (2005-present)

Distinguished Member of Technical Staff: Bell Laboratories, Murray Hill, NJ (2005)

Member of Technical Staff: Bell Laboratories, Murray Hill, NJ (1991–2004)

Intern Statistician: General Electric Corporate R&D, Schenectady, NY (1988, 1989)

Professional Activities

President, ASA Albuquerque Chapter (2006-2007)

Vice President, ASA Albuquerque Chapter (2005-2006)

Associate Editor, Technometrics (1994-2001)

Judging Captain, North Jersey Regional Science Fair (1993, 1994)

Vice President, ASA Northern NJ Chapter (1992-1993)

Program Committees:

Quality and Productivity Research Conference, Yorktown Heights, NY (2003)

Chair, ASA/IMS Spring Research Conference, New Brunswick, NJ (1997)

Chair, ASQ Fall Technical Conference, St. Louis (1995)

ASQ Fall Technical Conference, Birmingham, AL (1994)

ASA/IMS Spring Research Conference, Chapel Hill, NC (1994)

CHEM Chemometrics and Environmetrics Meeting, Bologna, Italy (1993)

Symposium on Experimental Design, ASA Northern NJ Chapter (1993)

Professional Awards

ASA Fellow (2005)

ASA prize for Outstanding Statistical Application (2002): Modeling Bandwidth of Optical Fiber, Golowich et. al.

ASQ Frank Wilcoxon Prize for the Best Practical Application: Modeling Bandwidth of Optical Fiber, Golowich et. al.

George W. Snedecor Award for Outstanding Ph.D. Candidate in Statistics, ISU (1990)

Bell Labs Awards

President's Award for the Warranty Expense Reduction Project (2004)

Teamwork Award for Optical System Yield Improvement (2003)
President's Award for the Clarity Paradigm Team (1998)
Significant Technical Achievement Award for Improving Preform Manufacturing with Velocity and Chemical Ramping (1996)

Patents

Cao, J., Davis D., Vander Wiel, S., Yu, B. (2004). No. 6,785,240. Method For Estimating The Traffic Matrix Of A Communication Network.
Chambers, J., James, D., Lambert, D., Vander Wiel, S. (2004). No. 6,820,090. Method For Generating Quantiles From Data Streams.

Papers

Vander Wiel, S.A., Wilson, A.G., Graves, T.L., Reese, C.S. (2010). "A Random Onset Model for Degradation of High-Reliability Systems." *Technometrics*, in press.
Hamada, M.S., Huzurbazar, A.V., Vander Wiel, S.A. and Wilson, A.G. (2009). "Assessing the Risks of Sampling Rates for Surveillance." Submitted.
Liu, C., Zhang, J., Lawrence E. and Vander Wiel, S. (2009). "An Alternative Dempster-Shafer Approach To Inference From Multinomial Data." Submitted.
Liu, C. and Vander Wiel, S.A. (2007). "Statistical Quasi-Newton: A New Look at Least-Change" *SIAM Journal on Optimization*, 18(4), pp. 1266–1285.
Crowder, S., and Vander Wiel S.A. (2007). "Exponentially Weighted Moving Average Control Charts." *Encyclopedia of Statistics in Quality and Reliability*, F. Ruggeri, R. Kenett, F. Faltin, eds. Wiley, Chichester, UK, 824-828.
Chambers, J.M., James, D.J., Lambert, D. and Vander Wiel, S.A. (2006). "Monitoring Networked Applications using Incremental Quantiles" with discussion, *Statistical Science*, 21(4), pp. 463-486.
Bu, T., Chen, A., Vander Wiel, S.A. and Woo, T. (2006). "Design and Evaluation of a Fast and Robust Worm Detection Algorithm." *IEEE INFOCOM 2006*, Barcelona, Spain.
Liu, C., Vander Wiel, S.A., Yang, J. (2003). "A Nonstationary Traffic Train Model for Fine Scale Inference From Coarse Scale Counts." *IEEE Journal on Selected Areas in Communications*, 21(6), pp. 895–907.
Golowich, S.E., Landwehr, J.M., and Vander Wiel, S.A. (2002). "Interplay Between Physics and Statistics in Modeling Bandwidth of Optical Fiber." *Technometrics*, 44(3), pp. 215–229.
Cao, J., Davis, D., Vander Wiel, S., Yu, B. (2000). "Time-Varying Network Tomography: Router Link Data" *Journal of the American Statistical Association*, 95(452), pp. 1063–1075.
Vander Wiel, S.A. (1996). "Monitoring Processes that Wander Using Integrated Moving Averages." *Technometrics*, 38(1), pp. 139–151.
Vander Wiel, S.A. (1996). "Optimal Discrete Adjustments for Short Production Runs" *Probability in the Engineering and Informational Sciences*, 10, pp. 119–151.
Vander Wiel, S.A. and Vardeman, S.B. (1994). "A Discussion of 'All or None' Inspection Policies." *Technometrics*, 36(1), pp. 102–109.
Tucker, W.T., Faltin, F.W., and Vander Wiel, S.A. (1993). "Algorithmic Statistical Process Control: An Elaboration." *Technometrics*, 35(4), pp. 363–375.
Eick, S.G., Loader, C.R., Long, M.D., Vander Wiel, S.A., and Votta, L.G. (1993). "How Many Errors Remain in a Software Design Document After Inspection." *Computing Science and Statistics: Proc. of the 25th Symposium on the Interface*, Michael E. Tarter and Michael D. Lock (editors). Interface Foundation of North America, San Diego, pp. 195-202.
Vander Wiel, S.A. and Votta, L.G. (1993). "Assessing Software Designs using Capture-Recapture Methods." *IEEE Transactions on Software Engineering*, 19(11), pp. 1045-1054.
Faltin, F.W., Hahn, G.J., Tucker, W.T., and Vander Wiel, S.A. (1993). "Algorithmic Statistical Process Control: A Tool for Reducing Product Variability - Some Practical Observations." *International Statistical Review*, 61(1), pp 67-80.

- Eick, S.G., Loader, C.R., Long, M.D., Vander Wiel, S.A., and Votta, L.G. (1992). "Estimating Software Fault Content Before Coding." *Proc. 14th International Conference on Software Engineering*, pp. 59–65.
- Vander Wiel, S.A. and Vardeman, S.B. (1992). Discussion of "Statistical Process Monitoring and Feedback Control—A Discussion" by G.E.P. Box and T. Kramer. *Technometrics*, 34(4), pp. 278–281.
- Vander Wiel, S.A., Tucker, W.T., Faltin, F.W., and Doganaksoy, N. (1992). "Algorithmic Statistical Process Control: Concepts and an Application." *Technometrics*, 34(3), pp. 286–297.
- Vander Wiel, S.A. and Meeker, W.Q. (1990). "Accuracy of Approximate Confidence Bounds Using Censored Weibull Regression Data From Accelerated Life Tests." *IEEE Transactions on Reliability*, 39(3), pp. 346–351.

Invited Talks

- "Graph Anomalies in Cyber Communication" (2010). Joint Statistical Meetings, Vancouver, Canada.
- "Statistical Characterization and Detection Methods for Cyber Security Data" (2009). SIAM Annual Meeting, Mini Symposium on Mathematical Challenges in Cyber Security, Denver, CO.
- "Monitoring a Stockpile that Might Decay" (2007). Spring Research Conference on Statistics in Industry and Technology, Ames, IA.
- "Network Attacks: Detection and Traceback" (2005). First Bell Labs Research Summit, Murray Hill, NJ.
- "Incremental Quantiles for Monitoring Business Services" (2005). ASA Annual Meeting special topic session, Minneapolis, MN.
- "Interplay Between Physics and Statistics in Modeling Bandwidth of Optical Fiber" (2003). ASA Annual Meeting Special Invited Session.
- "Yield Trend Analysis and Technology Transfer" (2003). Quality and Productivity Research Conference.
- "Technology Transfer in Industry using an R-DCOM Interface" (2003). Symposium on the Interface: Computing Science and Statistics.
- "Graphics and Computations for Split-Plot Experiments" (1997). ASA Delaware Chapter Statistics Conference; also at 50th Anniversary Conference for Iowa State University Statistics Department.
- "Residual-based Monitoring of Autocorrelated Processes" (1996). ASA Annual Meeting, Chicago. Discussion of "Stochastic Optimization Multivariate Problems" (1996) ASA Annual Meeting, Chicago.
- "Improving Optical Fiber Uniformity Using a Glass Deposition Model" (1995). International Conference on Statistics for Quality and Productivity, Seoul; also at Computing Science and Statistics, Symposium on the Interface, Pittsburgh.
- "Statistical Process Monitoring using Integrated Moving Averages" (1994) ASA Winter Meeting, Atlanta.
- "Algorithmic Statistical Process Control" (1994). Sematech Workshop on Statistical Process Control, Austin.
- "Capture-Recapture Methods for Software Inspection Data" (1994). ASA Annual Meeting, San Francisco.
- "Understanding Data and Models through Graphics" (1993). Metropolitan Section ASQC conference on Quality Control and Statistics in Industry, Somerset, NJ.
- "Algorithmic Statistical Process Control: Concepts and an Application" (1993). CHESM Chemometrics and Environmetrics Meeting, Bologna, Italy.
- "Statistical Process Monitoring with Integrated Moving Average Noise" (1993). Symposium on "Statistics and Design in Automated Manufacturing," Tempe, AZ.
- "Algorithmic Statistical Process Control: Concepts and an Application" (1990). Joint Statistical Meetings, Anaheim, CA.